REMARKS

The Examiner's rejection of Claims 1-4 and 7-12 under 35 U.S.C. §102(b) as being anticipated by Goldstein, U.S. Patent No. 6,117,297 is noted. In rejecting the claims on this basis, the Examiner has contended that the Goldstein patent discloses each and every limitation of the rejected claims. The Examiner's rejection of the remaining claims, i.e. Claims 5-6 under 35 U.S.C. §103(a) as being unpatentable over Goldstein as applied to the claims aforementioned, and further in view of Schmidt et al. U.S. Patent 6,274,020 is also noted. Regarding the §103 rejection, the Examiner contends that the present invention:

> as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made [sic] to modify the disclosure of Goldstein with the teachings of Schmidt, because the Schmidt patent teaches that such use of the bolts is routinely used in the art to hold the electrodialysis cell together. The bolts would have to be coated with an electrically resistant material, since otherwise the cell would short out when an electric current was sent through the anode and cathode.

It is respectfully submitted that the Goldstein reference neither anticipates, nor renders obvious, the claims of the present application. The present claims are directed towards an electrodialysis system and a method of electrodialysis treatment. However, it is respectfully submitted that those skilled in the art should recognize that the Goldstein reference incorrectly refers to the invention disclosed therein as relating to electrodialysis rather than electrodeionization. It is respectfully submitted that electrodeionization is sometimes, incorrectly, referred to as electrodialysis. In this regard, in U.S. Patent No. 4,931,160, issued to A. J. Giuffrida on June 5, 1990, Giuffrida states as follows:

> The purification of a liquid by reducing the concentration of ions or molecules in the liquid has been an area of substantial technological interest. Many techniques have been used to purify and isolate liquids or to obtain concentrated pools of specific ions or molecules from a liquid mixture. The most well known processes include electrodialysis, liquid chromatography, membrane filtration and ion exchange. A lesser known methodology is electrodeionization, occasionally mistermed filled cell electrodialysis. Although electrodeionization has the potential to be quite effective in removing ions from liquid, it has never been developed to the degree that it is competitive either structurally or operationally with the

> better known separation techniques. This is due primarily to the inconsistencies of structural design and unpredictable variances incurred by the presently known modes of use. This lack of structural design precision and nonpredictability of results have reduced the use of electrodeionization to the point where it is relatively unknown even to practitioners skilled in separation methodologies.
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> The overall design guards against scaling in the first stage while optimizing the overall salt removal, membrane utilization and energy requirement. In comparison, electrodialysis cannot product meg-ohm quality water because it is inefficient in the low salinity range and requires more membrane area and energy. It would be desirable to provide an electrodeionization apparatus and method which provides improved ion removal efficiency as compared to presently available apparatus.

'160 Patent, Col. 1 lines 15-35, and Col. 2 lines 59-68. Rather than relating to the field of electrodialysis, as is the case with the present invention, the Goldstein invention relates to the field of electrodeionization (EDI). In this regard, the abstract to the Goldstein reference states that:

> The integral, monolithic frame-membrane may be used in apparatus for carrying out gas-separation; microfiltration; ultrafiltration; nanofiltration; reverse osmosis (i.e. hyperfiltration); diffusion dialysis; Donnan dialysis; electrodialysis (including filled-cell electrodialysis; i.e. electrodeionization); pervaporation; piezodialysis; membrane distillation; osmosis; thermo osmosis; and electrolysis with membranes. Also disclosed are pillows prepared from ion exchanging films or fabrics (which may be porous or non-porous), the pillows filled with ion exchange structures such as beads, fibers, fabrics or rods.

It is respectfully submitted that the object of the Goldstein invention is to facilitate ease of unloading and reloading the ion exchange resins commonly used in conjunction with EDI. See generally Goldstein's "Background of the Invention". Goldstein states:

> The above mentioned patents also disclose that the IXB can be removed from an assembled ED stack by reversing the direction of flow through the stack. However equipment for hydraulic removal of and refilling with IXB may not be available in the field in which case removal and refilling may be very inconvenient, sometimes requiring return of filled stacks to the factory for service.

> (Some filled cell ED stacks have the spacer-frames sealed to the IX membranes (see e.g. "Electro-Regeneration of Ion-Exchange Resins" Final Report [of Southern Research Institute] to Artificial Kidney-Chronic Uremia Program of the National Institute of Arthritis and Metabolic Diseases, PB 210,163 (1972) page 55). Such stacks can of course be designed to permit filling with and removal of IXB hydraulically but if not so designed then the stacks must be returned to the manufacturer for service. The apparatus disclosed in the above mentioned Final Report operated at constant current, used IXB of substantially uniform size (e.g. Rohm and Haas Stratabed-84 and Stratabed-93) as well as Type II AXB (e.g. Amberlite IRA 410 and 910 and Duolite A-102D).
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> Thus it is desirable to have more convenient ways of filling ED stacks with IXB and removing such IXB from such stacks while at the same time achieving any desired geometric arrangement of the IXB. Other objects will be obvious from the following examples and appended claims.

Col. 21 lines 16-41. It appears that at least one purpose of the Goldstein invention was to replace traditional ion exchange resin columns. As stated above, it is respectfully submitted that Goldstein incorrectly refers to the invention disclosed therein as relating to electrodialysis rather than electrodeionization. It is respectfully submitted that electrodialysis techniques (particularly as disclosed in the present application) and electrodeionization techniques (particularly as discussed by Goldstein) are not competing technologies and one skilled in the art would not be motivated to modify an electrodialysis stack, particularly the type of stack disclosed in Schmidt et al. U.S. Patent No. 6,274,020, with Goldstein's techniques for facilitating ease of unloading and reloading the ion exchange resins commonly used in conjunction with electrodeionization.

Further, the geometry described by Goldstein is primarily resultant from Goldstein's objective of facilitating ease of unloading and loading ion exchange resin; with the narrower cavities resultant from the use of dual channels allowing better distribution of the ion exchange resins within the cavities and less pressure drop. The Goldstein reference does not address the effect of the thinner channel design on utilization in sparingly conductive, viscous fluids such as ethylene glycol-water mixtures. In the current application, it is recognized that the thinner channels promote better mixing and separation characteristics for sparingly conductive fluids such as ethylene glycol-water mixtures, as well as other fluids for electrodialysis and

that limitations of membrane area per unit cell can be overcome through use of the split multi-channel paths within a single cell. The use of split channel cells in parallel as a roughing de-mineralizer or operated in series for single-pass continuous flow, allowing improved separation characteristics is not suggested or taught by either the Goldstein or Schmidt reference.

As stated above, it is respectfully submitted that Goldstein does not anticipate claims 1-4 or 7-12. Goldstein teaches a method/apparatus for facilitating ease of unloading and reloading the ion exchange resins commonly used in conjunction with electrodeionization and does not disclose a multi-cell stack for electrodialysis. Further, in view of this fundamental difference between Goldstein and the present invention it is respectfully submitted that, for the reasons stated above, it would not be obvious to modify Goldstein with the teachings of the Schmidt reference. There is no motivation, suggestion or teaching within either Goldstein or Schmidt to modify the Goldstein reference in the manner suggested by the Examiner. Accordingly, it is respectfully submitted that Claims 5-6 are not obvious in view of Goldstein and Schmidt. Therefore, the Examiner is respectfully requested to reconsider and withdraw both the §102 and the §103 rejections to the present claims.

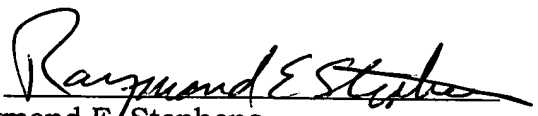
Accordingly, Applicants respectfully request withdrawal of the Examiner's 35 U.S.C. §102 rejections of claims 1-4 and 7-12 along with the Examiner's §103 rejections of claims 5-6. Claims 1-12 are deemed allowable over the cited prior art. Accordingly, it is respectfully submitted that the §102 and §103 rejections have been traversed and that Claims 1-12, inclusive of the above requested amendments, are allowable over the prior art.

In view of a discussion of the claims remaining in the present application with respect to the prior art, it is deemed that the above-identified patent application is now in a condition for the issuance of a Notice of Allowance. Such action by the examiner is respectfully requested. However, if the Examiner is of the opinion that any claim is still not allowable, it will be appreciated if he will telephone the undersigned to expedite the prosecution of the present patent application.

Please charge any additional fees associated with this communication, or credit any overpayment, to Deposit Account No. 16-1910.

Respectfully submitted,

PITTS AND BRITTIAN, P.C.

By 
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